EFFECTIVE DATE June 16, 1997	LANL-EES-13-DP-614, R0 Page 1 of 8

DATA COLLECTION SYSTEM CONFIGURATION ACCEPTANCE TESTING

LOS ALAMOS

QUALITY PROGRAM

APPROVAL FOR RELEASE	
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Los Alamos
Yucca Mountain Site Characterization Project

HISTORY OF REVISION

REVISION NO.	EFFECTIVE DATE	PAGES REVISED	REASON FOR CHANGE
R0	06/16/97	N/A	Initial procedure.

DATA COLLECTION SYSTEM CONFIGURATION ACCEPTANCE TESTING

1.0 PURPOSE

This Detailed Technical Procedure (DP) describes the operational process for conducting configuration acceptance testing (CAT) for the data collection system (DCS) on the Yucca Mountain Site Characterization Project.

2.0 SCOPE

This process will ensure data collection hardware (systems) are configured by DCS Staff and accepted by the Data Manager for use in the Exploratory Studies Facility (ESF). This process will document CAT activities and verify the system conforms to specifications and functions with the established configuration.

3.0 REFERENCES

FWP-ESF-96-001, Exploratory Studies Facility Data Collection Systems
LANL-YMP-QP-12.3, Control of Measuring and Test Equipment and Standards
AP 17.1Q, Record Source Responsibilities for Inclusionary Records

4.0 DEFINITIONS

4.1 Accuracy Calculation - Documentation that describes the combined system accuracy measured with the system and the process calibrator.

4.2 Engineering Unit. The output of a raw signal, such as ohms, translated into a unit, such as degrees Celsius, by the software documented in the Instrument Software Configuration.

4.3 Instrument Index. The documentation that describes the instrument parameters and acceptance criteria applied to the Instrument Software Configuration.

4.4 Instrument Software Configuration. The documentation that describes the DCS measurement type and range for a particular instrument and the conversion to Engineering Unit.

4.5 Loop Index. The documentation that describes the hardware connection from the field instrument to the DCS measurement device within the system.

4.6 Process Calibrator. Measuring and Test Equipment (MT&E) used to emulate an instrument signal.

4.7 System interface. The system terminal block number (TB#) and terminal block channel number (TB CH#) described in the Loop Index.

4.8 Test Fixture. A device to connect the process calibrator with multiple channels of the system interface.

5.0 RESPONSIBILITIES

The following personnel are responsible for the activities identified in Section 6.0 of this procedure:

- Data Manager
- DCS Engineering Support
- DCS Staff
- DCS Technical Support

6.0 PROCEDURE

The use of this procedure must be controlled as follows:

- If this procedure cannot be implemented as written, YMP personnel should notify appropriate supervision. If it is determined that a portion of the work cannot be accomplished as described in this DP, or would result in an undesirable situation, that portion of the work will be stopped and not resumed until this procedure is modified or replaced by a new document, or current work practice is documented in accordance with QP-03.5, subsection 6.1.6

- Employees may use copies of this procedure printed from the controlled document electronic file; however, employees are responsible for assuring that the correct revision of this procedure is used.

- When this procedure becomes obsolete or superseded, it must be destroyed or marked “superseded” to ensure that this document is not used to perform work.

6.1 Principle

PIs and other project personnel from various affected organizations may require the use of information obtained from systems that have undergone CAT. Acquired qualified data from systems that have undergone CAT will be submitted to the technical data base and/or records systems. It is the responsibility of individuals using this acquired data to perform any data reduction or development.

6.2 Equipment

The following equipment is used, but is not limited to, in the implementation of this procedure:

- process calibrator
- data collection hardware (systems)

6.2.1 Equipment Malfunctions

Due to calibration and configuration, any malfunctions will be apparent. Malfunctions will be documented, reported to the Data Manager, and addressed.

6.2.2 Safety Considerations

Before working in construction areas, CAT personnel will survey the work area to identify potential hazards such as moving equipment, electrical hazards, and tripping/falling hazards. Underground operations shall be conducted within the general underground training (GUT) guidelines under the constructor's supervision and safety responsibilities.

6.2.3 Special Handling

N/A

6.3 Preparatory Verification

N/A

6.3.1 Hold Points

N/A

6.3.2 Calibration

The equipment identified in Section 6.2 above are M&TE and will be calibrated in accordance with QP-12.3.

6.3.3 Environmental Conditions

N/A

6.4 Control of Samples

N/A

6.5 Implementing Procedure

6.5.1 **DCS Engineering Support or DCS Staff** obtains or develops the Instrument Index, the Instrument Software Configuration, accuracy calculations and the Loop Index documentation based on the needs of the PIs.

6.5.2 **DCS Engineering Support** directs DCS Technical Support to conduct CAT activities for specific channels, when the Loop Index, the Instrument Software Configuration, or the criteria from the Instrument Index is initiated or revised for those channels.

6.5.3 **DCS Technical Support or DCS Staff** perform CAT activities by:

6.5.3.1 Documenting the signal path from the process calibrator to the system output screen, including test fixtures when applicable.

6.5.3.2 Documenting the process calibrator serial number, system serial number, and the applicable instrument identifier.

6.5.3.3 Simulating process condition(s) (i.e. the instrument output signal) within the range of the instrument identifier from the Instrument Index at the system interface with the process calibrator.

NOTE: Typically the low, medium, and high ranges are simulated for each channel.

6.5.3.4 Documenting the process calibrator source value at each point and the raw value display or engineering units measured with the systems' measurement device utilizing the Instrument Software Configuration for each of the simulated process condition point(s) in step 6.5.3.3.

6.5.3.5 Comparing the process calibrators source value to the measurements made through the systems measurement device utilizing the Instrument Software Configuration.

6.5.3.6 Ensuring the measurements meet the acceptance criteria identified in the Instrument Index and accuracy calculation by documenting pass or fail for the channel.

6.5.3.7 Initialing and dating the documentation.

6.5.3.8 Submitting the CAT results to DCS Engineering Support for authentication or to the Data Manager upon completion of CAT for system channels.

NOTE: For CAT activities completed by DCS Technical Support the documentation is submitted to DCS Engineering Support. Activities completed by other DCS Staff is submitted directly to the Data Manager.

6.5.4 **DCS Engineering Support** submits CAT documentation by:

6.5.4.1 Authenticating the documentation produced by DCS Technical Support in 6.5.3.

6.5.4.2 Submitting the CAT results to Data Manager for evaluation and inclusion in the records package.

6.5.5 **DCS Data Manager** finalizes CAT activities by:

6.5.5.1 Evaluating the CAT against the acceptance criteria.

6.5.5.2 Directing the DCS Engineer or DCS Staff to make necessary corrections in accordance with subsections 6.5.1 through 6.5.4.2.

OR

Authenticating the acceptable CAT documentation.

6.5.5.3 Developing and submitting to the Records Processing Center in accordance with AP-17.1Q, a record package that includes the records identified in Section 7.0.

6.6 Data Acquisition and Reduction

Actual data collection and reduction is beyond the scope of this procedure. It is the responsibility of Principal Investigators using this acquired data to perform any data reduction or development.

6.7 Potential Sources of Error and Uncertainty

Drift in the calibration of equipment, or transposing channel criteria or results are the only potential sources of error identified. Regular calibration of the process calibrator and systems along with the manager's evaluation of the results will minimize the probability of these errors impacting results.

7.0 RECORDS

Implementation of this procedure results in the generation of the authenticated CAT results documentation. CAT results include the process calibrator serial number, the system serial number, the instrument identifier, the process calibrator source value(s), the systems' measured raw value or engineering unit display, pass or fail, equipment malfunctions, the CAT date, the DCS Technical Support initials, the DCS Engineering Support authentication when applicable, and the data manager acceptance. This information may be documented in a report or other suitable method in accordance with AP-17.1Q.

Include or reference the Instrument Index, the Loop Index, the Instrument Software Configuration, and accuracy calculations including revision numbers. Also include a printout of applicable information from the Loop Index and Instrument Software Configuration sorted on the same fields as the Instrument Index to provide for traceability between the documents.

8.0 ACCEPTANCE CRITERIA

CAT is deemed acceptable when the Data Manager evaluates the results documentation against the acceptance criteria used to perform CAT and determines the system configuration to be adequate for its intended purpose.

9.0 TRAINING REQUIREMENTS

Personnel who conduct work in accordance with Section 6.0 of this procedure require training to this DP. Training is accomplished by “read only.”

10.0 ATTACHMENTS

N / A